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The Devil Is in the Detail: Tasmanian Devil and Tasmanian Tiger Paintings From Awunbarna and Injalak Hill, Northern Territory, Australia

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ABSTRACT

Both the Tasmanian devil (*Sarcophilus harrisii*) and the Tasmanian tiger (*Thylacinus cynocephalus*) are believed to have become extinct on the Australian mainland about 3000 years ago. However, until now there were only 23 known rock art depictions of the Tasmanian devil and about 150 Tasmanian tiger paintings and petroglyphs, mostly at rock art sites in northern Australia. In this article, we report recently documented images of these species from two locations in Arnhem Land, Northern Territory, including two previously undescribed Tasmanian devil paintings in different styles and several thylacines. We then consider reasons why there are so many more depictions of Tasmanian tigers than devils in Australian rock art and whether either species became extinct in Arnhem Land more recently than previously thought.

RÉSUMÉ

On pense que le diable de Tasmanie (*Sarcophilus harrisii*) et le tigre de Tasmanie (*Thylacinus cynocephalus*) ont disparu du continent australien il y a environ 3000 ans. Cependant, jusqu'à présent, on ne connaissait que 23 représentations rupestres du diable de Tasmanie et environ 150 peintures et pétroglyphes du tigre de Tasmanie, principalement sur des sites d'art rupestre du nord de l'Australie. Dans cet article, nous présentons des images récemment documentées de ces espèces provenant de deux sites de la Terre d'Arnhem, dans le Territoire du Nord, dont deux peintures de diables de Tasmanie inédites, de styles différents, ainsi que plusieurs représentations de thylacines. Nous examinons ensuite les raisons de la surrection des représentations de tigres de Tasmanie par rapport à celles de diables de Tasmanie dans l'art rupestre australien et nous nous demandons si l'extinction de ces deux espèces en Terre d'Arnhem est plus récente qu'on ne le pensait.

1 | Introduction and Background Information

The aim of this article is to report on and discuss recently documented paintings of quadrupeds at western Arnhem Land rock art sites that can be argued to be depictions of Tasmanian devils (*Sarcophilus harrisii*) and Tasmanian tigers (*Thylacinus cynocephalus*), species long extinct on mainland Australia. Besides adding to the corpus of such imagery published by other rock art

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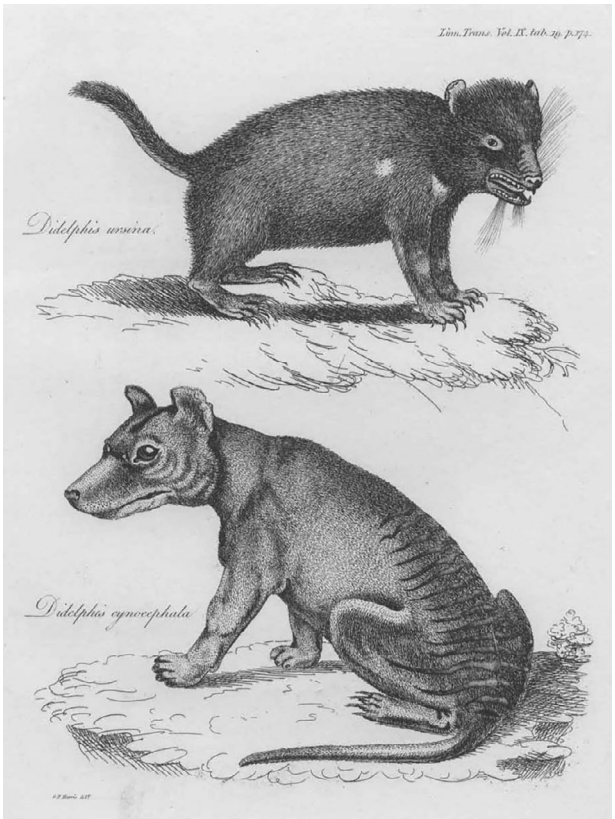

FIGURE 1 | The earliest European drawing of a Tasmanian devil and a thylacine (Harris 1808, Figure 1, between pages 174 and 175).

researchers, our results contribute to debate about the timing of extinction and what importance these creatures may have had for past and present Aboriginal Australians.

The Tasmanian devil (*Sarcophilus harrisii*) and the Tasmanian tiger (*Thylacinus cynocephalus*), also known as thylacine, were first described scientifically in 1808 by George Prideaux Harris, the then Deputy Surveyor of Van Diemen's Land (Figure 1). As Holmes (2023, 49) notes for the thylacine, 'The species was originally given the scientific name *Didelphis cynocephala* (dog-headed opossum), alongside the Tasmanian devil (*Didelphis ursina*) or bear opossum' by Harris. Later in the 1800s, there were various taxonomic name changes to both species, resulting in the current classifications and the Tasmanian devil being named after Harris. To date, few skeletal remains of devils or thylacines have been found in Arnhem Land (Northern Territory, Australia), but part of a Tasmanian devil mandible was recovered from an excavation at the Padypadiy rock shelter near the East Alligator River in a deposit dated to 3120 ± 100 BP. (Calaby and White 1967). Nearby, at the Madjedbebe rock shelter, Clarkson et al. (2017, 308) recovered a thylacine maxillary fragment painted with red ochre dated to '2.7–3.9 calibrated kyr BP'.

White et al. (2018) provide 24 and 20 new dates for devil and thylacine remains respectively and estimate that the mainland devil and thylacine extinctions occurred between 3179 and 3227 years BP. This was probably a result of competition with dingoes that were introduced to Australia between 3500 and 5000 years ago (Fillios and Taçon 2016) and human predation but also possibly climate change (Brown 2006; Brüniche-Olsen et al. 2018, but see Morris et al. 2022). Until recently, the thylacine was believed to have disappeared from Tasmania in the 1930s, but on the basis of recent uncertainty modelling of the sightings record, it has been argued that 'this iconic predator probably persisted until the 1980s' (Brook et al. 2023, 1).

Holmes and Linnard (2023) present a detailed discussion about all aspects of the thylacine in 80 short chapters, while Owen and Pemberton (2023) provide the most up-to-date account of the Tasmanian Devil; however, examples in rock art are only briefly discussed in the former (i.e., Mulvaney 2023). Depictions of Tasmanian devils are particularly rare in Australian rock art, occurring sporadically in parts of northern Australia. For instance, for western Arnhem Land, only 14 depictions of Tasmanian devils have been reported, including 6 by Chaloupka (1984, 292, 299, 340; 1993, 99–100, 106, 236; see also Murray and Chaloupka 1984, 105). Two of these paintings are in the Large Naturalistic style, while three are in the more recent Dynamic Figure style (Chaloupka 1984), argued to have been produced between 10,000 and 13,000 years ago, and one is in the early X-ray form (Chaloupka 1993, 99; see Taçon et al. 2020, 218 for the most up-to-date western Arnhem Land rock art chronology). Calaby and Lewis (1977) describe two other paintings of devils, Lewis (1988a, 1988b) noted two more and Gunn (2016, 49) recorded one in the Large Naturalistic style near Nawarla Gabarnmang, southern Arnhem Land. An early X-ray Tasmanian devil in Deaf Adder Gorge, Kakadu National Park, was recorded in 1992 but not published (Taçon 1992, 133).

Cameron et al. (2012, ii) published a photograph from the Museum and Art Gallery of the Northern Territory collection of two further Tasmanian devils from an Arnhem Land site depicted side by side. They are in white with red outlines and have X-ray details such as internal organs, digestive tracts and eyes with optic nerves, something characteristic of western Arnhem Land paintings of animals made in the past 1000 years. All of the Tasmanian devil depictions usually have a large, rounded head; prominent whiskers; four limbs of roughly equal length but often with exaggerated front legs; hind feet with dog-like paws; marsupial genitalia; hair on the dorsal side of the tail; and robust, short toros (Lewis 1988b, 122).

For the Kimberley of Western Australia, Walsh (2000, 399) published a likely painting of a Tasmanian devil similar to some Arnhem Land paintings identified as *Sarcophilus*, and Welch (2015a, 90, 173) published a Kimberley painting of a devil that is one of two at the Dotted Macropod Gallery. All three Kimberley paintings are assigned to Welch's 'Archaic Period', one of the earliest phases of Kimberley rock art. Veth et al. (2018) refer to it as the 'Irregular Infill Animal' period, dating to about 18,000–36,000 years ago (Veth et al. 2018, 31).

There are six possible depictions of *Sarcophilus* in Pilbara rock art. These petroglyphs are quadrupeds that have many diagnostic devil features, and Aboriginal custodians see them as Tasmanian devils (McDonald et al. 2021, 274–275). Initial suggestions by McCarthy (1976) of two possible Tasmanian devil representations on Groote Island and one in the Sydney Basin have been dismissed (Calaby and Lewis 1977, 150). Consequently, until now, only 17 painted depictions of Tasmanian devils at rock

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art sites from across Australia have been documented, 14 in western Arnhem Land and three in the Kimberley, as well as six Tasmanian devil petroglyphs recorded in the Pilbara, for a total of 23 *Sarcophilus* depictions.

In contrast, images of thylacines, although relatively rare compared to those of macropods and other species, can be found in the rock art of many parts of Australia, with at least 50 petroglyphs representing thylacines in the Pilbara (Mulvaney 2009; 2023, 53; Wright 1972), many paintings in the Kimberley (Motta 2022; Walsh 2000, 396–398; Welch 2015a, 2015b), and numerous depictions across western Arnhem Land (Brandl 1972; Chaloupka 1993; Lewis 1988a; Taçon et al. 2011; Welch 2015b). Rare occurrences have sometimes been found elsewhere, including a painting 25 km southwest of Albury-Wodonga at Mt Pilot, Victoria (Gunn 1983), and a charcoal drawing in Wollemi National Park, New South Wales (Taçon et al. 2011). Welch (2015a, 41) recorded 23 depictions of thylacines in the Kimberley and 30 in Arnhem Land. In the Kimberley, thylacines were occasionally painted in pairs (Walsh 2000, 396) as in western Arnhem Land, and to date about 150 depictions of thylacines have been recorded and reported at Australian rock art sites.

In western Arnhem Land rock art, several dozens of thylacine paintings have been recorded (Lewis 1988a, 88) in many different styles, including the Large Naturalistic (e.g., Chaloupka 1984, 108; Lewis 1977; Taçon et al. 2011), Dynamic Figure (at least 16; see Chaloupka 1984, 1993; May et al. 2018; Taçon et al. 2011), Maliwawa (Taçon et al. 2020), Yam Figures (Chaloupka 1993, 98) and Early X-ray styles (Brandl 1972, 26; Gunn 2016, 48; Lewis 1988a, 88, Figure 64 and Plate 3; Taçon 1989, 143; Welch 2015b, 43). The most impressive panel of thylacine paintings is found at Mount Brockman, south of Jabiru (Flood 1997, 272; Chaloupka 1984, 108). It consists of five paintings of Large Naturalistic style thylacines, including one nose-to-nose with a thylacine pup. At another site in the Nabarlek area to the northeast, a thylacine was depicted nursing four pups (Lewis 1988a, 194, Figure 55; 2017, 91, Figure 7). Chaloupka (1993, 98) provides a good description of what constitutes thylacine depictions:

> The thylacines are depicted as elongated dog-like animals with a long tapering tail, a series of vertical stripes and marsupial genitalia. In males, the penis is posterior to the scrotum and directed backwards where it projects from beneath the tail. That the female had a backward-opening pouch with four nipples is depicted in a painting of this animal with four young feeding pups …. Paintings depicting the animal vary in size from a 12-centimetre diminutive representation to a 250-centimetre long, larger than life-size image.

Clegg (1978, 19–20) argued that when we assume that ancient artists producing rock art were depicting something real, then distinguishing features and species differences would be encoded into depictions and 'it can be stated that a picture is of that target object which it most closely resembles' (1978, 20). Clegg used 'a mathematical formula, devised from contemporary pictures/drawings of various animals, to assess whether a particular depiction is likely to be of any given creature, in order to discriminate which could be of thylacines' (Taçon et al. 2011, 167). However, his formula is problematic as paintings were not measured in the field. Instead, photographs and/or drawings made from photographs by other researchers were used without taking into account photographic distortions due to camera angles when pictures were taken. Furthermore, it is complex, and Clegg did not provide enough information to fully replicate his methodology, leading to other rock art researchers focusing instead on key criteria for a more straightforward determination. For instance, Taçon et al. (2011, 167) argue that at least six criteria should be evaluated when assessing if a rock painting or petroglyph is of a thylacine:

1. Stripes (vertical, especially confined to back).
2. Overall shape (dog-like quadruped, long body).
3. Ear shape/size (short, rounded).
4. Head shape (long muzzle, rounded rather than pointed nose).
5. Tail (long, straight and tapered from hindquarters, sometimes with tuft at tip).
6. Length of forelimbs and hind limbs (should be the same).

Although there has been much debate about what constitutes a thylacine image (Akerman 2009; Chaloupka and Murray 1986; Clegg 1978; Lewis 1986; 2016; Murray and Chaloupka 1984; Taçon et al. 2011, 148–149; Welch 2015b), if an image meets all six criteria, it is probably a representation of a thylacine but some depictions might be of thylacines even though only four or five of the six criteria are satisfied. For instance, Mulvaney (2009, 42) observes that some rock art images are thylacine-like in every way except that they lack stripes and suggests that before the arrival of the dingo in Australia 'it can be argued that the relative proportion of the four limbs, and not the colour banding, distinguished the thylacine from other marsupials' (Mulvaney 2009, 42). It also needs to be noted that there is variation in how thylacines are depicted, even within style periods, sometimes as the result of the shape of the panel on which an image has been placed (Mulvaney 2023, 53). Furthermore, Lewis (2016) illustrates 12 thylacine rock paintings from Arnhem Land that show wide variation in body and head shapes. However, they all are essentially dog-like in appearance.

Lastly, there are three instances of depictions of thylacines or devils in western Arnhem Land that were renewed by repainting at a much later time. Taçon et al. (2011) report an instance of a Large Naturalistic painting of a thylacine being superimposed with a Dynamic style thylacine but leaving many aspects of the original visible including the head and tail. Taçon and Webb (2017) describe an enigmatic thylacine-like animal image that was repainted, and with a larger head added, so that the resulting painting has a mix of thylacine, Tasmanian devil and *Thylacoleo*-like features. A fading Early X-ray style Tasmanian devil was repainted in such a way that it incorporated the original head and upper torso but changed the back of the torso, hind legs and tail. Furthermore, instead of just having a body cavity like the original, the new smaller image includes a representation of what appears to be the heart and/or lungs (Taçon 1989, 153, Figure 38).

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FIGURE 2 | Map showing the location of Awunbarna (Mt Borradaile) and Injalak Hill, Northern Territory, Australia (map by Andrea Jalandoni). Map data: Google; Imagery Google and its data providers.

Here, we report 2 previously undescribed depictions of Tasmanian devils and 14 thylacines from Awunbarna (Mount Borradaile) and Injalak Hill (next to Gunbalanya) in western Arnhem Land (Figure 2), which have been documented as part of 2 research projects conducted since 2018. Depictions of extinct animals can be difficult to identify (Taçon and Webb 2017), and there is a history of claim and counterclaim in Australian rock art research (e.g., Murray and Chaloupka 1984 vs Lewis 1986 vs Chaloupka and Murray 1986). Bednarik (2013) assessed over 100 years of claims of rock art depictions of extinct Australian fauna and concluded that there are no strong identifications of extinct Australian fauna other than some thylacines and Tasmanian devils. Lewis (2017, 82) later supported and elaborated on this. Consequently, Lewis' (1988b, 122) list of diagnostic Tasmanian devil features mentioned above was used to ascertain what paintings could be *Sarcophilus* depictions. For thylacines, criteria set out by Taçon et al. (2011, 167) were used to determine which images were thylacines or other creatures, keeping in mind variability noted by Lewis (2017). This led to some paintings of quadrupeds being rejected and considered more likely to be depictions of quolls, dingoes or macropods.

2 | Awunbarna Tasmanian Devils and Tigers

2.1 | Tasmanian Devils

A Dynamic Figure style Tasmanian devil painting (Figure 3) was found in August 2023. It is located on a low panel just above ground level with human figures and other animals also in the Dynamic style. It is 0.4-m long and a painting of an eel-tail catfish is superimposed over part of it. It is similar to a Dynamic Figure style painting of a devil illustrated by Lewis (1988a, 193), which also has exaggerated, extended front legs. The painting fulfils all of Lewis' (1988b, 122) criteria as it also has a robust, short torso, a large, rounded head with prominent whiskers, hind feet with dog-like paws, marsupial genitalia and hair on the dorsal side of the tail.

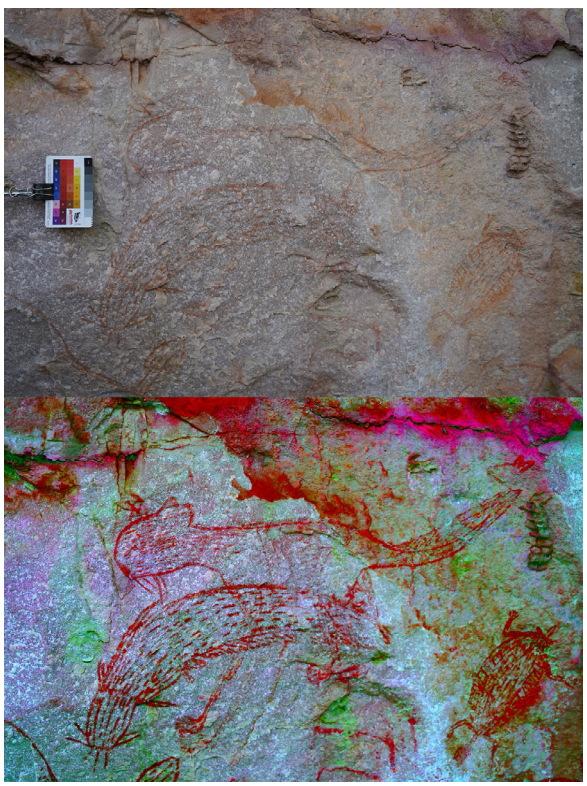

FIGURE 3 | Awunbarna Dynamic period Tasmanian devil found in 2023. The DStretch version (ywe) reveals the long front legs, whiskers and hair on the upper side of the tail (photo: Paul S.C. Taçon).

The second Awunbarna rock painting of a Tasmanian devil (Figure 4) has been known since the 1990s but previously

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FIGURE 4 | A painting of a Tasmanian devil in an Awunbarna cave-like site that is in a northwest Arnhem Land late Holocene style. In the DStretch version (yre) barbed lines that may represent spears are more evident (photo: Paul S.C. Taçon).

undocumented. It is located in a large cave-like rock shelter and is in a late Holocene northwest Arnhem Land style with widely spaced cross-hatch infill and early X-ray features such as a body cavity depicted. The animal is 0.62-m long, has a very large, rounded head and a slightly open mouth showing upper and lower teeth but lacks whiskers. The torso is short and robust, while rear legs with dog-like paws are shown stretched behind the body. It has marsupial genitalia and at first glance appears to have four faint stripes but the lines do not cover all of the torso and extend outside the back top. One line has barbs, and there is another line with barbs hanging down from the stomach. A third barbed line appears to pierce the left leg, and all of these lines may represent spears. Some hair is indicated at the tip of the dorsal side of the tail. The painting is superimposed over a red hand stencil and the remains of a what appears to be a bird with cross-hatch infill, bending forward to the left. A small fish-like form was later painted over the devil's legs.

2.2 | Thylacines

At Awunbarna there are eight rock paintings of thylacines at five sites, with three sites each having two paintings of thylacines. The first site has a Tasmanian tiger in the Large Naturalistic style (Figure 5) on a wall panel in a shelter several metres above ground. It was located in the 1990s but has not been previously described in detail, although Roberts and Parker (2003, 93) published a photograph of it. They claimed there was a second,

FIGURE 5 | A thylacine in the Large Naturalistic style with a painting of a macropod superimposed over it at site AW20 (photo: Paul S.C. Taçon).

smaller, thylacine superimposed over the top of it, but close examination reveals the second animal is a macropod and what appear to be stripes are lines defining the rear legs of the large thylacine painting underneath. It has a typical highly curved macropod tail, macropod head shape and back legs that are longer than the front limbs. The thylacine painting underneath is 1.44-m long, has a horizontally depicted tapering tail typical of many thylacine paintings, stripes on most of its body and a thylacine head shape with prominent snout rather than a macropod head shape. Also, unlike macropods, the front legs are the same length as the back legs. It has all six thylacine features noted by Taçon et al. (2011, 167) and listed above.

A second Large Naturalistic thylacine (Figure 6) was discovered by our team in August 2023. It is on a vertical wall panel in a ground level shelter with a low ceiling and measures 1.18 metres long by 0.43 metres high but part of the tail has washed away. It has the remains of at least six vertical stripes, the overall shape is dog-like with a long body, it has short, rounded ears on a head that has a long muzzle and a rounded pointed nose. It also has a long, mostly straight tail and the length of forelimbs and hind limbs is the same, so it satisfies all six criteria for classifying it as a thylacine.

At one Awunbarna site there are two faint Maliwawa style thylacines that are oriented vertically with heads facing down (Figure 7), similar to some in the Namuidjbuk estate of the Wellington Range to the northeast where a total of six Maliwawa thylacines were recorded (Taçon et al. 2020, 213). The Awunbarna Maliwawa thylacines were mentioned by Taçon et al. 2020, 213) but not described. They are on a wall panel a few metres above ground with several Maliwawa human figures, one thylacine at the far-left end of the scene and the other in the middle with four human figures to its right and four to its left. The one at the left has bent front legs while the other has exaggerated front legs that appear longer than the hind legs. They have dog-like bodies, short and rounded ears, long muzzles, long tapering tails that curve upwards and, although they lack stripes, resemble thylacines more than any other species.

At a second Awunbarna site with Maliwawa style rock art two thylacines were also placed vertically but with their heads facing up, side by side and next to a scene of 4 closely packed Maliwawa human figures reaching out to each other (Figure 8). The panel is near the top of an eroded sandstone pillar, about 10 metres above ground, and can be seen from far away. The scene and

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FIGURE 6 | Awunbarna thylacine painting discovered in August 2023. In the DStretch version (lds) key features such as stripes and the head are more visible (photo: Paul S.C. Taçon).

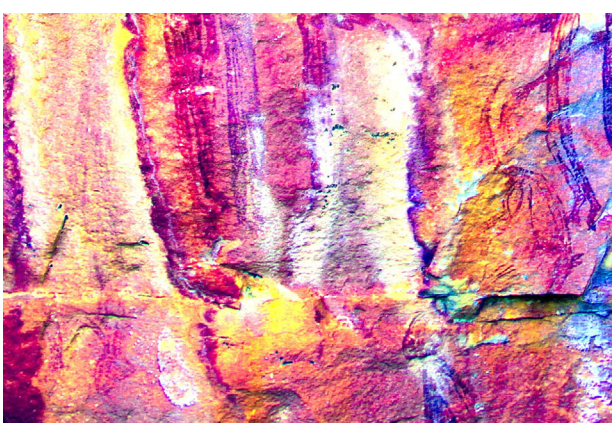

FIGURE 7 | Two Awunbarna vertical thylacines with heads facing down can be seen on either side of this DStretch (lds) version (original photo: Paul S.C. Taçon).

the thylacines appear to have been made at the same time and are over four earlier Maliwawa humans which are in turn over a Dynamic macropod. A small Maliwawa human is partly over the first in the scene so there was one Dynamic Figure and three Maliwawa painting events at the site. They have open mouths, but teeth were not depicted. They have all the essential thylacine

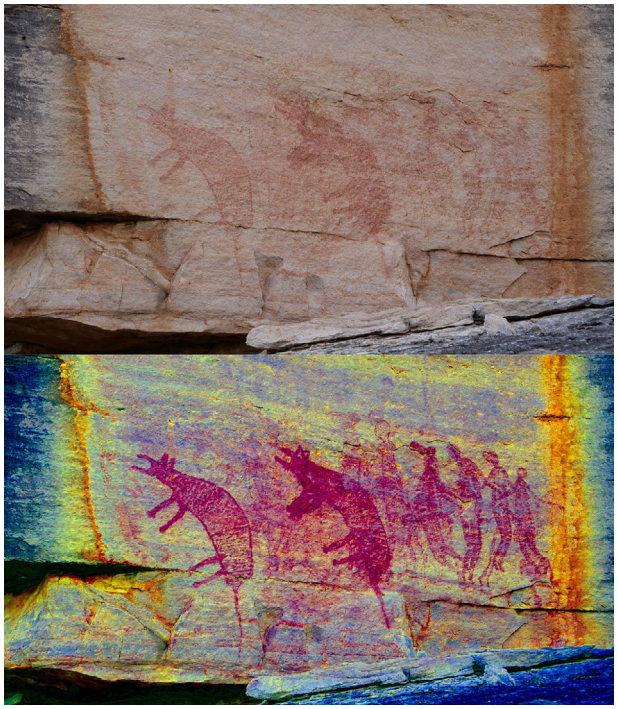

FIGURE 8 | Two Awunbarna Maliwawa style thylacines with heads facing up over and next to Maliwawa human figures and DStretch version (ids) (photo: Joakim Goldhahn).

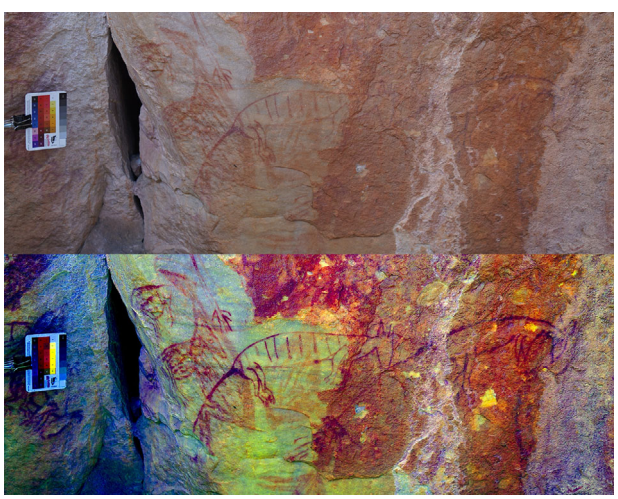

FIGURE 9 | Awunbarna's smallest thylacines painted side by side in a mid-Holocene style. In the DStretch version (lds) key features such as stripes on the first and similar head shapes are more visible (photo: Paul S.C. Taçon).

features, including dog-like bodies and heads, front and rear legs of equal length and long straight tails, but lack stripes.

Lastly, at another Awunbarna site there are two more thylacines placed horizontally next to each other, the first with stripes and the second without (Figure 9). They are the smallest thylacine depictions, measuring 30 cm wide and 36 cm long respectively, and are in a mid-Holocene style. Both have a long, dog-like body, rear and front limbs of equal length and a thylacine head shape with prominent snout and short ears. Each has a long tail that

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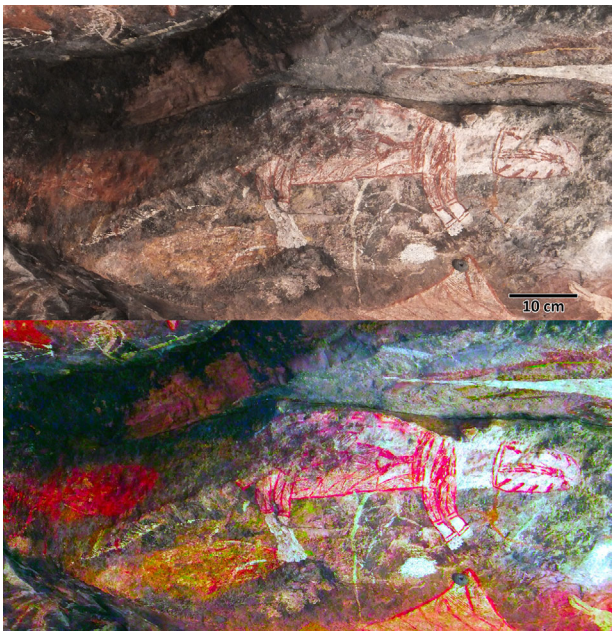

FIGURE 10 | Red and white painting of a thylacine, Main Gallery, Injalak Hill and Dstretch version (lab) (photo: Paul S.C. Taçon).

curves downward. Overall, they are so similar in form and colour that they undoubtedly were painted by the same artist in a single painting episode. Given that one has stripes while the second does not suggests that artists who made depictions of thylacines at rock art sites did not always need to include stripes. In other words, body shape was enough to show it was a thylacine, as Mulvaney (2009, 42) has argued for engravings of thylacines in the Pilbara region of Western Australia. A third small thylacine-like figure measuring 24 cm in length with longitudinal lines running through its body is elsewhere on the panel. It is similar to the two figures described above, but the body is fatter and more macropod-like so exactly what was depicted cannot be ascertained. There are also two small outline macropods on the panel painted in the same style and likely by the same artist. Importantly, their body shapes are also fatter than the thylacine paintings, head shapes are different and front limbs are shorter than hind limbs.

3 | Injalak Hill

There are six thylacines at Injalak Hill at five separate sites, all in very different styles. Three of them face south, two face east and one south-southwest. Notably, none of them have clear stripes. The best-known thylacine painting at Injalak Hill (Figure 10) is on the east side of the Main Gallery, painted on an east facing panel. All tours to Injalak Hill include a visit to the Main Gallery (also referred to as the First Gallery by the tour guides). The thylacine's head is pointing north. It is likely less than 1000 years of age given the late Holocene style and extensive use of white pigment painted with internal (X-ray) features. White pigment is kaolin (pipe clay), coarse, sits on the rock surface rather than penetrating and staining the way red ochre does, and generally does not last very long (Chippindale and Taçon 1998, 103–104). It is quite well preserved compared to other thylacine depictions and likely the most recently painted one identified at Injalak Hill

FIGURE 11 | Injalak Hill Large Naturalistic style thylacine with sharp teeth and Dstretch version (ybk) (photo: Craig Banggar).

and Awunbarna. It has a dog-like body with and long tapering tail that dips downward, rounded ears and long rounded snout. Lines on the snout may indicate teeth inside. The length of the forelimbs and hind limbs are the same but it lacks stripes. Therefore, it fulfils five of the six criteria for a thylacine.

The second Injalak thylacine (Figure 11) has prominent teeth depicted in a long, oval head. It is located on a part of Injalak Hill visitors are taken to and a partial photograph of it was published (Injalak Arts 2018, 22) but it has not been documented and described in detail before. It is painted in the Large Naturalistic style in a dark red colour on a panel facing south and the head facing west. It is a large dog-like figure, 1.32 m in length, with a big head that has a prominent muzzle. There are remnants of what could potentially be ears, but too little is left to determine the shape. It also lacks stripes. The length of the forelimbs is slightly shorter than the hind limbs but that could be due to perspective because the animal is depicted diagonally as if half-standing on the hind limbs. The tail is long, curves downward and is tapered. It has marsupial male genitalia (scrotal sac) that a more recently placed nearby human figure appears to be grasping. It fulfils enough of the criteria to widely be accepted as a thylacine.

A Large Naturalistic style thylacine was identified by the team in June 2025 (Figure 12). The figure is on a southern facing panel by itself, with an unobstructed view of the horizon. Unfortunately, part of the head and ears are missing as the rock broke sometime after the painting was made. However, what remains of the head is dog-like. The body is long and dog-like, while the tail is long, curves downward and tapered. The limbs are the same length but there are three or four forelimbs, which could mean the artist

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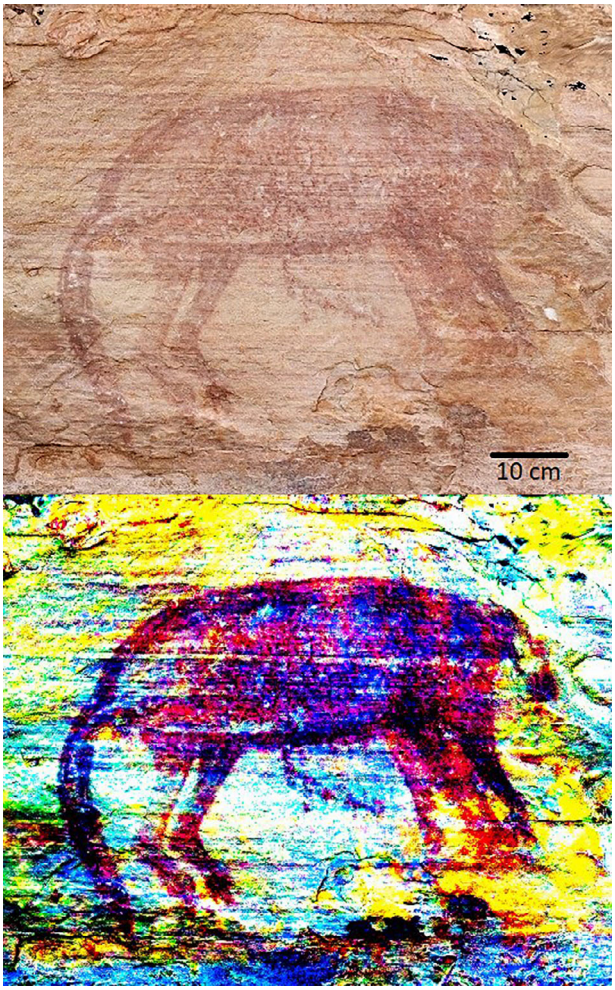

FIGURE 12 | Injalak Hill Large Naturalistic style thylacine alone on a panel and Dstretch version (lds) (photo: Benedict Dyson).

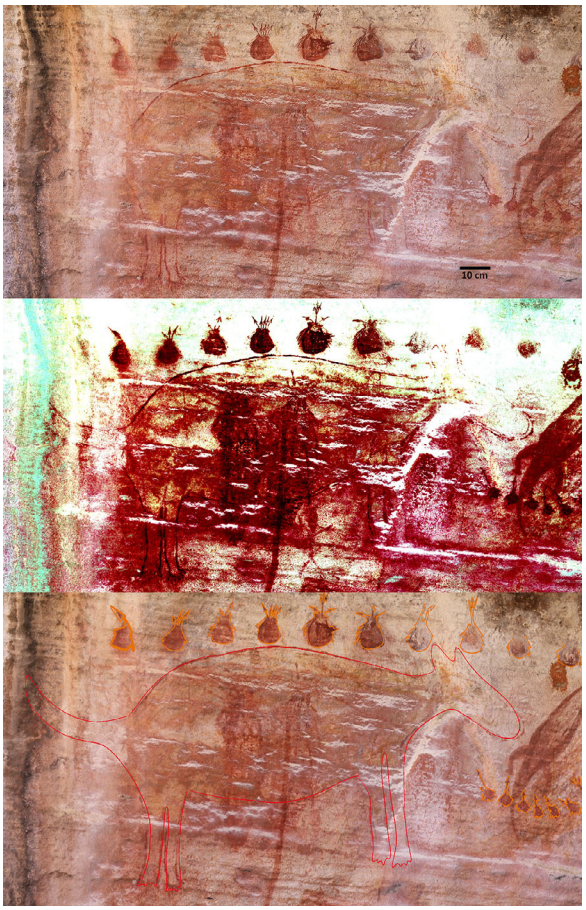

FIGURE 13 | Injalak Hill Large Naturalistic thylacine underneath Bobby Nganjmirra's yams, Dstretch version (Y) and digital tracing (photo: Shaun Namarnyilk).

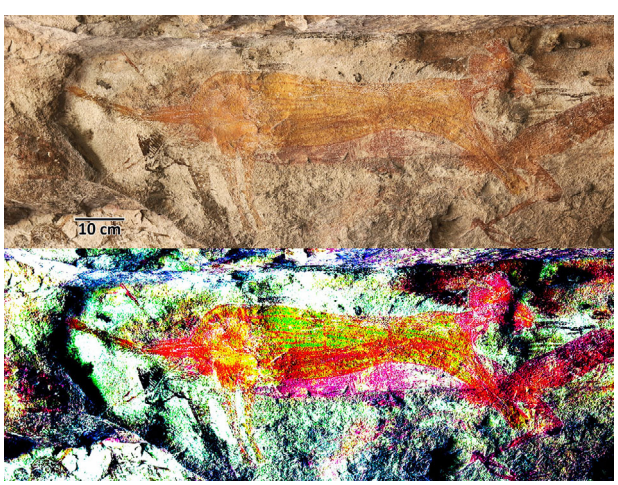

FIGURE 14 | Yellow and red Injalak Hill thylacine and Dstretch version (lab) (photo: Benedict Dyson).

corrected the initial painting or it was later painted over by a second artist. There are no stripes.

Another Large Naturalistic style thylacine was identified by the team in July 2025 (Figure 13). It is located around the west corner of the Main Gallery on a panel facing south-west, underneath well-known yams painted by famous Injalak artist, Bobby Nganjmirra. It is in outline form and due to water flow its tail and head are only visible after applying DStretch, which would explain why it would have gone unnoticed despite its proximity to the central part of the Main Gallery. It is a large figure with a long dog-like body, long rounded dog-like head facing east, short, rounded ears, long tapered tail that curves upward, and the limbs are the same length. There are no stripes and it appears that there was an attempt to redraw the figure as the head has two outlines in different shades and thickness.

The fifth Injalak thylacine (Figure 14) is complex as it appears to have been repainted twice. Originally it was yellow with a red outline and horizontal red lines through the length of the body in a style thought to date between 2000 and 4000 years ago. The head and neck were later repainted solid red. At some point in the past few hundred years white hatching and cross-hatching was added over most of the figure. Such infill is very recent in the Arnhem Land sequence and white paint does not last long, usually washing away in less than a few hundred years.

The panel in which it was painted faces south while the thylacine itself faces east. The overall shape is of a long-bodied dog-like creature with a dog-like head that has wide round ears. The tail is long, slightly pointing upward and tapered with a tuft at the

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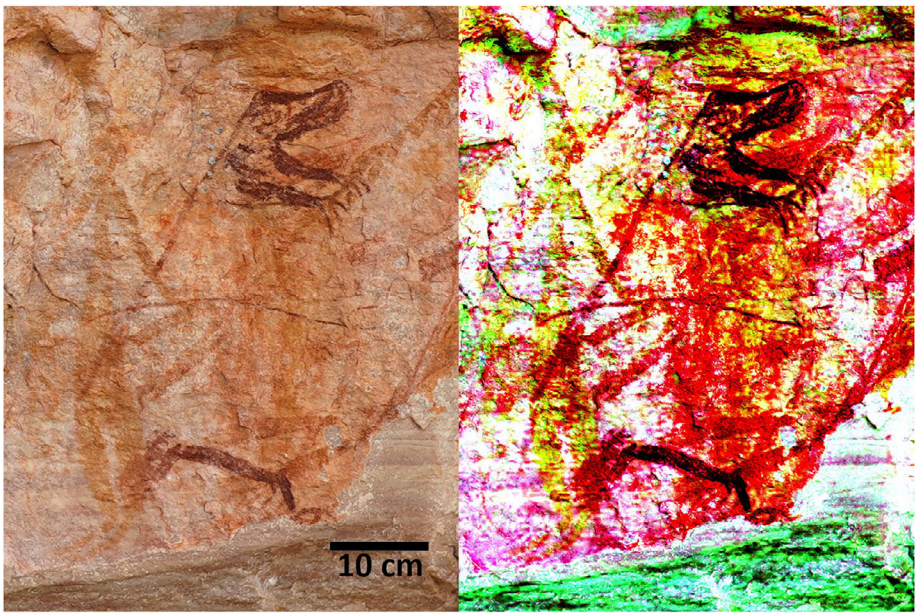

FIGURE 15 | Injalak Hill Large Naturalistic style and Dstretch version (yrd) (photo: Benedict Dyson).

tip. The limbs are of similar length but there are no stripes. It is a depiction of a male thylacine as the scrotal sac has been painted below the tail and behind the rear legs.

A sixth possible thylacine on Injalak Hill in the Large Naturalistic style was identified by the team in July 2025 (Figure 15). It is incomplete with only its head and forelimbs remaining. It has a long dog-like body. Its dog-like head has very short, rounded ears and a long snout. There is a Maliwawa human figure beside it and it is partly underneath an oval of beeswax pellets. Unfortunately, this does not help with an age determination of the painting as radiocarbon dating the beeswax would provide a minimum age of less than a few thousand years at most, given the oldest dates obtained for figures made of beeswax are about 4000 years old (Taçon et al. 2004), and the Large Naturalistic style is much older.

In summary, one of the Awunbarna presumed Tasmanian devil rock paintings meets all of Lewis' (1988b, 122) devil depiction criteria, a very strong indication that it is an actual representation of a Tasmanian devil. For the second there is a strong case for it being a painting of a Tasmanian devil as it has all but one definitive feature, whiskers (Table 1). Three of the thylacine paintings from Awunbarna meet all of Taçon et al.'s (Taçon et al. 2011, 167) tiger depiction criteria, a very strong indication they are, indeed, paintings of thylacines. The other five rock paintings meet five of six of Taçon et al.'s tiger depiction criteria, strongly suggesting they are thylacines. The six Injalak identifications are less strong, with three meeting five of six of Taçon et al.'s tiger depiction criteria, two having four of six distinguishing features and one only three, although in two cases parts of the paintings have weathered away. However, all of them appear to resemble thylacines more than any other Arnhem Land past or present fauna.

4 | Ethnographic Accounts

There is no known ethnographic information about Tasmanian devils from anywhere in mainland Australia but names and sometimes stories about thylacines have been collected in various parts of western Arnhem Land and one part of the Kimberley. For the latter, a Wunambal name for the thylacine was recorded in 1988. Wunambal elder Geoffrey Mangolamara stated it was called *ngaliwan* and 'that it had not occurred in his country for many generations' (Burbidge 2023, 58). However, when linguists recorded Kimberley plant and animal names in 1999 and 2008 from other Wunambal and Gaambera people and asked about the thylacine they were unable to obtain a name for it 'and unfortunately, information passed down through many generations has now disappeared as the old people have died' (Burbidge 2023, 58).

In September 1986, Taçon (1989, 265) interviewed Badmardi elder Nipper Kapirigi about a Rainbow Woman painting (see Taçon et al. 2022, 710, Figure 5) at Djuwarr, Deaf Adder Gorge, Kakadu National Park and Kapirigi conveyed his understanding of thylacines and their relationship to the Rainbow Serpent (Almudj) at the same time:

> Kapirigi and others also describe depictions of thylacines as 'Almudj dog' or the dogs of the Rainbow Serpent. They are said to reside under the water now. 'That dog, long one… that's the one we call djangerrg. That Almudj dog, him under the water again. Him under the water. That's where the Rainbow got it.' This underscores their antiquity and indicates that contemporary Aborigines regard them as belonging to the ancient Dreamtime past (Taçon 1989, 265).

Chaloupka (1993, 50) elaborates on this with more information from Kapirigi:

> It is said that the Rainbow Snakes have as their companions *djanggerrk*, described as 'dogs' but identified in rock paintings as the thylacine or Tasmanian tiger (*Thylacinus cynocephalus*). The cicatrices across an

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TABLE 1 | Paintings of Tasmanian devils and thylacines described in the text from Awunbarna (AW) and Injalak Hill (IH) with style and distinguishing features indicated.

Presumed subject	Style	Criteria met	Conclusions
Tasmanian devil 1	Dynamic figure	Short, robust torso; large, rounded head with prominent whiskers; hind feet with dog-like paws; marsupial genitalia; hair on dorsal side of tail	Meets all of Lewis' (1988b, 122) criteria; **very strong** indication it is a depiction of a Tasmanian devil Upward tail; male with marsupial scrotal sac
Tasmanian devil 2	Early X-ray	Short, robust torso; large rounded head with teeth but no whiskers; hind legs with dog-like paws; marsupial genitalia; some hair on dorsal side of tail	Meets all of Lewis' criteria except lacks whiskers; **strong** indication it is a depiction of a Tasmanian devil Upward tail; male with marsupial scrotal sac
AW thylacine 1	Large Naturalistic	Stripes on most of its dog-like long body (1, 2); a thylacine head shape with prominent snout and short, rounded ears (3, 4); long straight tapering tail (5); front legs are same length as back legs (6)	Has all six thylacine features emphasised by Taçon et al. 2011, 167); **very strong** indication it is a thylacine Horizontal tail
AW thylacine 2	Large Naturalistic	Six vertical stripes (1); overall shape is dog-like with a long body (2); has short, rounded ears on a head that has a long muzzle and a rounded pointed nose (3, 4); has a long, straight tail (5); the length of forelimbs and hind limbs is the same (6)	Has all six thylacine features; **very strong** indication it is a thylacine Horizontal tail
AW thylacine 3	Maliwawa	Dog-like body (2); short and rounded ears on head with long muzzle (3, 4); long upward curving tapering tail (5); bent front legs but same length as back legs (6); lacks stripes	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Upward tail
AW thylacine 4	Maliwawa	Dog-like body (2); short and rounded ears on head with long muzzle (3, 4); long upward curving tapering tail (5); exaggerated front legs that appear longer than the hind legs (6); lacks stripes	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Upward tail
AW thylacine 5	Maliwawa	Dog-like body (2); short and rounded ears on head with long muzzle (3, 4); long straight tail (5); front and hind legs of equal length (6); lacks stripes	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Horizontal tail
AW thylacine 6	Maliwawa	Dog-like body (2); short and rounded ears on head with long muzzle (3, 4); long straight tail (5); front and hind legs of equal length (6); lacks stripes	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Horizontal tail
AW thylacine 7	Mid-Holocene	Stripes on most of its long, dog-like body (1,2); thylacine head shape with prominent snout and short ears (3, 4); long tail curved downward (5); rear and front limbs of equal length (6)	Has all six thylacine features; **very strong** indication it is a thylacine Downward tail

(Continues)

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TABLE 1 | (Continued)

Presumed subject	Style	Criteria met	Conclusions
AW thylacine 8	Mid-Holocene	Long, dog-like body (2); thylacine head shape with prominent snout and short ears (3, 4); long tail curved downward (5); rear and front limbs of equal length (6); lacks stripes	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Downward tail
IH thylacine 1	Late Holocene X-ray	Long dog-like body (2); rounded ears and long rounded snout (3, 4); long straight tail (5); length of the forelimbs and hind limbs the same (6); no stripes	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Downward tail; teeth indicated
IH thylacine 2	Large Naturalistic	Large dog-like figure (2); big dog-like head with prominent muzzle but only remnants of ears (4); tail is long, curves downward and is tapered (5); length of forelimbs slightly shorter than the hind limbs but was depicted diagonally as if half-standing on hind limbs (6); no stripes	Meets 4 of 6 criteria but has very small ear remnants; **probable** thylacine Downward tail; teeth indicated; male with marsupial scrotal sac
IH thylacine 3	Large Naturalistic	Body is long and dog-like (2); what remains of the head is dog-like (4); tail is long, curves downward and tapered (5); limbs are the same length (6)	Meets 4 of 6 criteria but has the area where ears would have been depicted broken off; **probable** thylacine Downward tail
IH thylacine 4	Large Naturalistic	Long dog-like body (2); long rounded dog-like head with short rounded ears (3, 4); long tapered tail that curves upward (5) limbs are the same length (6); no stripes.	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Upward tail
IH thylacine 5	Mid-Holocene with recent white cross-hatching	Long-bodied dog-like creature (2); dog-like head with wide round ears (3, 4); long tail slightly pointing upward and tapered with tuft at tip (5); limbs of similar length (6); no stripes	Meets 5 of 6 criteria; **strong** possibility it is a thylacine Upward tail; male with marsupial scrotal sac
IH thylacine 6	Large Naturalistic	Long dog-like body (2); short, rounded ears on dog-like head with long muzzle (3, 4); no stripes	Only meets 3 of 6 criteria but is a partial figure; possible thylacine Tail is missing

> initiated person's chest are said to be similar to the dark stripes marking the rear part of this animal. When the people cross the flooded streams during the wet season, the *djanggerrk* swim alongside, protecting them from *galkberd*.

Galkberd is a male common wallaroo and the 'dark side' of the Rainbow Serpent responsible for bringing rain from the southeast. Chaloupka (1993, 53) adds:

> Rainbow Snakes that live in the deep splash pools below waterfalls have a pair of these dogs, a male and a female, as their associates. The locality itself is usually named after the male dog. At the head of the Djuwarr Gorge is the Mirbolol Waterfall. There, the two spirit dogs, Mirbolol and Gorrogorro, are painted in a shelter adjacent to the fall.

The association of the thylacine with the Rainbow Serpent and water is found in other stories about thylacines across Arnhem Land. For instance, in July 1993 Taçon recorded oral history about thylacines from Kunwinjku elder Big Bill Birriya-Birriya at a rock shelter called Nabarrbinwerrhmeng (which means 'man of the Barrbin clan cleared the ground'), near the Liverpool River. On the ceiling is a large painting of a thylacine with a large snake with dot infill nearby. Big Bill said the Kunwinjku name of the thylacine was Djankerrk and that among the Kunwinjku it is said to belong to the Rainbow Serpent. He also said the old people occasionally saw one and that it belongs to Ngalyod (Rainbow Serpent). 'If you see one of these things try to kill it quickly because they are dangerous and will take you under the

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water' he warned. 'Today we don't see them but the old people used to see them and that's why they painted them in shelters—they may have appeared in times of big rain' (in Tacon 1993, 129–130). Twenty-nine paintings of Rainbow Serpents have been documented at Awunbarna but only one, less than 1000 years of age, has dog-like creatures associated with it, with three small ones painted over part of the Serpent's tail.

Stories linking thylacines with rain, Rainbow Serpents, bodies of water and swimming suggest some knowledge of thylacine behaviour survives as the earliest mention of the swimming ability of thylacines was by Joseph Milligan in February 1852 in an address to the Royal Society of Van Dieman's Land at which he stated 'The aborigines report that this animal is a most powerful swimmer; that in swimming he carries his tail extended, moving it as the dog often does, and that the nose, eyes, and upper portion of the head are the only parts usually seen above water' (in Royal Society of Tasmania 1853, 310).

Occasionally, paintings of thylacines are still made by Kuninjku and Kunwinjku Arnhem Land artists but instead of on rock they are made on bark, paper or canvas. For instance, acclaimed Kuninjku artist John Mawurndjal painted a thylacine c. 1995 infilled with *rarrk* (cross-hatching) to highlight the power and special nature of the animal (see https://www.johnmawurndjul.com/works/animals-and-spirits/loan-26774-thylacine/). It was included in a retrospective exhibition of his work in 2018 called 'John Mawurndjal: I am the old and the new'. Later, Mawurndjal told linguist Murray Garde (1997, 43) that thylacines were Rainbow Serpent pets and that the Rainbow Serpent, rather than an Aboriginal artist, made a rock painting of a thylacine at a site called Milmilngkan.

In central Arnhem Land, another Kuninjku name for the thylacine is *Nawolbbolya* and in 2014 a bark painting with a thylacine above an antilopine kangaroo was made by Kuninjku artist Berribob Dangbungala Watson and featured in a short film called 'Nawolbbolya day Kolobbarr (Thylacine and Red Kangaroo)' (see https://www.youtube.com/watch?v=eG2Mn7II40M). Both the thylacine and the kangaroo are shown with *rarrk* (cross-hatching) and X-ray features consisting of various internal organs, and the thylacine's teeth are shown. The two animals had a big fight all over the rock country before stumbling off a cliff, turning into stone and entering into the Dreaming according to the narrated accompanying story. However, some artists living near Injalak Hill have a similar Dreaming story but it is a dingo that fights with the kangaroo. Elsewhere in Australia dogs (dingoes) are conflated with thylacines in traditional stories in places such as central Australia and the Flinders Ranges (Glaskin 2021). More recently, Kunwinjku artist Nicodemus Nayilibidg continued to keep knowledge about thylacines alive by painting one with bold stripes above an area of fine *rarrk* on canvas in 2017 (Figure 16).

In 2018, a children's book about two thylacines was published in Kunwinjku (Nabarlambarl et al. 2018). In the story they hunt and bring down a kangaroo by biting its tail. As linguist Nicholas Evans (2018) tells it:

> At the end of the story both the thylacines and the kangaroo fall off a cliff into a creek and are transformed into fish. The fact that the thylacine is transformed into an archer-fish (*njarlkan*) references the visual link that archer fish, like thylacines, have stripes on their tails… The story concludes: *Bolkkime wanjh kabirridi kore kunred kabolkngeyyo Djorlok. Mahni kunwok ngandi-marneyolyolmeng kobohkobanj namekke djankerrk bir-ridi kubolkwern manekkeken ngarrbenmarneyolyolme wurdwurd ngadberre*. 'They are all still there now at that place called Djorlok. This story was taught by old people because *djankerrk* used to be everywhere in this land. That's why we are telling this story to our children.'

FIGURE 16 | A thylacine painting on canvas made in 2017 by Kunwinjku artist Nicodemus Nayilibidj with bold stripes above an area of fine *rarrk* (private collection; photo: Paul S.C. Taçon).

Mulvaney (2023, 53) argues that the thylacine petroglyphs in the Pilbara must have had stories associated with them:

> Within the rock art images there is not just a record of the animal, there is associated meaning and story linked to the image. In one example, with the tail up rather than straight-out or slightly lower than the animal's back is to accord with the depiction of this animal urinating or marking territory (Figure 8). A mating pair is depicted on a rock in the inland Pilbara and young are depicted together with adult animals. There are examples, such as in Arnhem Land, where human figures are included with the animal and these appear to record Aboriginal people hunting the thylacine. The painting of the tail tuft may be a signalling device used by the artist, possibly mimicking thylacine behaviour.

The two paintings of Tasmanian devils described above have upward pointing tails and are male as their marsupial scrotal sacs are depicted. Two of the Injalak Hill thylacine paintings also are male with scrotal sacs. Four of the Awunbarna thylacines have horizontal tails, two have downward pointing tails and

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two have tails that point upward. Three Injalak thylacines have upward pointing tails and two downward. The tail of one possible depiction of a thylacine has weathered away. In terms of style, two Large Naturalistic thylacines have tails that point downward, two have horizontal tails and one has a tail that points upward. In contrast, two of the four Maliwawa thylacines have upward pointing tails and two have horizontal tails. One of the mid-Holocene thylacines has an upward pointing tail while the other two have tails that face downward. The tail of the late Holocene thylacine points slightly downward. Thus, the direction thylacine tails point toward is not related to style and the three tail positions may have communicated different specific meanings as Mulvaney (2023, 53) suggested for Pilbara thylacine petroglyphs. Only two thylacine paintings, from Injalak Hill, have tufts on the tips of their tails while two others from Injalak Hill have teeth indicated. This variation may also be related to storytelling when the paintings were made.

5 | Discussion and Conclusions

Rock art depictions suggest thylacines were more widespread and more culturally important across mainland Australia than Tasmanian devils as only 25 Tasmanian devil images have been documented, including the two described above, versus over 160 thylacine depictions. Thylacines may also have survived much longer in pockets of western Arnhem Land, the Kimberley and elsewhere than Tasmanian devils after the arrival of the dingo. And as thylacine expert Holmes notes for the thylacine:

> It must be pointed out that some bias is evident in the dataset used to infer an extinction chronology, as the fossil sites from which dates are taken are almost exclusively from southern Australia. Thus there is some potential for northern Australia to have been a refugia for the species, but future dating of northern Australian specimens will either support or disconfirm the currently accepted chronology (Holmes 2025, 3).

A charcoal drawing of a thylacine in Wollemi National Park in a style less than 3000 years of age suggests thylacines may also have survived in the rugged wilderness there longer than in most parts of mainland Australia (Taçon et al. 2011; Knights and Langley 2021, 104; Mulvaney 2023). Taçon et al. (2011, 170) concluded it could not be a depiction of a bandicoot, numbat, Tasmanian devil or a dingo:

> The Wollemi striped animal has many thylacine features, including the right head shape, ear shape and size, tail shape and position, body proportions and dog-like appearance, limbs of equal length, stripes in the appropriate area of the body and not used as infill for the whole creature. It scores six out of six for the key criteria. Amongst other species known from southeast Australia that have/had stripes on their fur, the only other possibility is a barred bandicoot, but the Wollemi drawing does not have the pointy nose of a bandicoot, and lacks other key bandicoot features… the drawing does not have numbat-like ears and other key numbat features such as an eye stripe. Nor does it have the body proportions of a Tasmanian devil. It also is very different from depictions of dingos at nearby sites, as the dingo drawings have curved tails, less elongated body proportions, larger and more pointed ears, among other things. A thylacine is the best fit for the Wollemi striped quadruped.

Western Arnhem Land has the most detailed oral history about thylacines from anywhere in Australia and stories about the creature continue to be told by some people today. In western Arnhem Land oral history thylacines are associated with Rainbow Serpents and often are described as the Rainbow Serpent's pets or dogs, sometimes in pairs and swimming. Three of the Awunbarna sites discussed above have pairs of thylacines and we have documented 29 paintings of Rainbow Serpents at Awunbarna. One of the Awunbarna Rainbow Serpents, less than 1000 years of age given the style and preservation, has three small thylacine-like creatures painted over part of its tail that are fresh-looking and do not appear to be very old. And as noted above, 'cicatrices across an initiated person's chest are said to be similar to the dark stripes' on thylacines (Chaloupka 1993, 50). This suggests a personal living connection to this extinct creature and the possibility of an ancient scarification tradition that began when thylacines still roamed Arnhem Land.

Stories of how thylacines hunted kangaroos are also told. Contemporary western Arnhem Land artists are inspired by these and related stories as well as rock art depictions so that occasionally paintings of thylacines are made on bark, paper and canvas. But contemporary paintings of Tasmanian devils or other extinct animals are not made despite lots of mythological creatures with animal, human-animal or human-like form made by western Arnhem Land artists today and in the past 100 years.

With the exception of the second *Sarcophilus* described above, there are no depictions of Tasmanian devils being hunted. Chaloupka (1993, 99) suggested a Tasmanian devil was shown being hunted at one site but the 'hunter' is a Dynamic Figure while the Tasmanian devil painting is in the Early X-ray style so therefore was added to the panel thousands of years later than the 'hunter'. However, there are paintings of thylacines being hunted in western Arnhem Land (e.g., Chaloupka 1993, 96–97), the Kimberley (Akerman 2009; Lewis 2017, 93; Welsh 2015b, 41) and the Pilbara (two examples, Mulvaney 2023, 53), presumably for food and possibly for symbolic material culture, such as the ochred thylacine jaw bone recovered from excavated deposit at the Madjedbebe rock shelter (Clarkson et al. 2017, 308).

Other examples of the cultural importance of thylacines for western Arnhem Land peoples include a painting of a Dynamic style thylacine with a dilly bag hanging from its neck and standing on a large headdress of a Dynamic human figure (Brandl 1973, 34, Figure 71; see Chippindale et al. 2000, 88, Figure 14 for the full scene), a double-headed thylacine with heads at each end of the torso (Taçon et al. 2022, 710, Figure 4), and two depictions of thylacines with pups in western Arnhem Land (Flood 1997, 272; Chaloupka 1984, 108; Lewis 1988a, 194, Figure 55; 2017,

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91, Figure 7) and another in the Pilbara (Mulvaney 2023, 53), something not shown for other species including dingoes.

Knights and Langley (2021, 108) highlight the cultural importance of the thylacine in Arnhem Land:

> Arnhem Land, in particular, appears to be a hotspot for potential evidence combining rock art depictions, oral history, fossil and archaeological evidence. We believe further investigations into the deposits within this region could provide additional evidence for thylacine material being integrated into material culture. There is also a distinct correlation between the surviving oral history and the presence of thylacines in artwork, suggesting that the thylacine was an important part of the cultural systems of both the Pilbara and Arnhem Land regions.

The red Awunbarna Tasmanian devil with prominent teeth depicted described above is likely about 3000–4000 years old given its style with early X-ray features and would have been made just prior to when *Sarcophilus* is believed to have become extinct on mainland Australia. The two white and red Tasmanian devil paintings with X-ray detail in Cameron et al. (2012, ii) are less than a thousand years of age given the recent style in which they were executed, the extensive use of white pigment and good preservation. The Injalak Hill thylacine painted at the Main Gallery is also likely less than 1000 years of age given the style and extensive use of white pigment. This suggests that the artists who made them may have seen actual living thylacines and Tasmanian devils and that some of these creatures survived longer in Arnhem Land than elsewhere on the Australian mainland. Alternatively, the artists may have been inspired by earlier depictions of each species. For instance, the production of the Injalak red and white thylacine may have been motivated by the Large Naturalistic style thylacine painting, also with prominent teeth depicted, about 100 metres away or other old thylacine paintings elsewhere. As Glaskin (2021, 179) concludes:

> The continuation of narratives associated with rock art sites depicting thylacines in Western Arnhem Land suggests that their physical inscription, which, as archaeologists recording these sites have noted, are 'naturalistic' depictions, serve both as an aide-mémoire for remembering and envisioning the morphology of a physically absent species, but also as an imprint or impression that allows for their continued (unseen) ontological dimensions to be inferred.

The recent Injalak rock painting of a thylacine, contemporary paintings of thylacines on portable media and a children's book about thylacines in Kunwinjku continue this process. Among other things, they provide access to knowledge about an important now extinct Arnhem Land animal for a wide range of contemporary western Arnhem Land people. The thylacine lives on in western Arnhem Land not as a ghost from the past but as a meaningful creature that still has present day relevance.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The authors have nothing to report.

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